

Predicting Sexual Problems in Women:
The Relevance of Sexual Excitation and Sexual Inhibition

Stephanie A. Sanders, Ph.D.,^{1,2,3} Cynthia A. Graham, Ph.D.^{1,3,4,6} and
Robin R. Milhausen, Ph.D.⁵

¹The Kinsey Institute for Research in Sex, Gender, and Reproduction, Indiana University,
Bloomington, Indiana, USA.

²Department of Gender Studies, Indiana University, Bloomington, Indiana, USA.

³Rural Center for AIDS/STD Prevention at Indiana University, Bloomington, Indiana, USA.

⁴Oxford Doctoral Course in Clinical Psychology, Isis Education Centre, Warneford Hospital,
Oxford, UK.

⁵Department of Family Relations and Applied Nutrition, University of Guelph, Ontario, Canada

⁶To whom correspondence should be addressed at Oxford Doctoral Course in Clinical
Psychology, Isis Education Centre, Warneford Hospital, Headington, Oxford OX3 7JX, England;
email: cynthia.graham@hmc.ox.ac.uk

RUNNING HEAD: Sexual Excitation and Sexual Inhibition

Correspondence and galley proofs:

Cynthia A. Graham, Ph.D.
Oxford Doctoral Course in Clinical Psychology
Isis Education Centre, Warneford Hospital
Headington, Oxford OX3 7JX
U.K.
+44 (0) 1865 226431
Fax: +44 (0) 1865 226364
E-mail: cynthia.graham@hmc.ox.ac.uk

ABSTRACT

Data from a non-clinical sample of 540 heterosexual women were used to examine the relationships between scores on the Sexual Excitation/Sexual Inhibition Inventory for Women (SESII-W) and ratings of current sexual problems, lifetime arousal difficulty, lifetime orgasm difficulty, and lifetime problems with low sexual interest. Multiple regression analyses also included several demographic/background variables as predictors: age, full-time employment, completed college, children in household, married, health ratings, importance of sex, and whether the woman was in a sexual relationship. The strongest statistical predictors of both current and lifetime sexual problems were the SESII-W inhibition factors Arousal Contingency and Concerns about Sexual Function. Demographic factors did not feature largely in any of the models predicting sexual problems even when statistically significant relationships were found. If future research supports the predictive utility of the SESII-W in identifying women who are more likely to experience sexual difficulties, these scales may be used as prognostic factors in treatment studies.

KEY WORDS: sexual arousal; sexual problems; women; inhibition.

INTRODUCTION

Although short-term sexual difficulties and concerns are relatively common among men and women, more persistent sexual problems are much less prevalent (Mercer et al., 2003). Previous studies have investigated the factors that predispose an individual to experience sexual problems. One factor that might be important is an individual's thoughts or cognitions about a sexual encounter or their ability to perform sexually. Barlow's (1986) model of sexual dysfunction postulates that specific cognitive schemata with which an individual enters a sexual situation are different in those with and without sexual dysfunction (see also Cranston-Cuebas & Barlow, 1990). Sexually dysfunctional cognitive schemata are characterized by negative expectations of sexual experiences (e.g., predictions of erectile failure for men).

More recently, Bancroft (1999) and Bancroft and Janssen (2000) proposed a dual control model, suggesting that individual differences in the propensity for inhibition and excitation of sexual response might be important determinants of sexual functioning. A basic tenet of the model is that there are separate, relatively independent excitatory and inhibitory systems and that the occurrence of sexual arousal depends on the relative activation of sexual excitation (SE) and sexual inhibition (SI) processes. In the majority of individuals and situations, inhibition is an adaptive mechanism. However, if SI is too high, particularly if coupled with low SE, then an individual might be vulnerable to experience sexual problems. To date, most of the research on the dual control model has been conducted using the Sexual Inhibition/Sexual Excitation Scales (SIS/SES), which were designed to assess the propensity for SE and SI in men (Janssen, Vorst, Finn, & Bancroft, 2002). Factor analysis using the SIS/SES yielded three higher-level factors: one related to SE (labeled "SES") and two inhibition factors: SIS-1 ("inhibition due to the threat of performance failure") and SIS-2 ("inhibition due to the threat of performance consequences").

Recent studies, using both clinical and non-clinical samples, have provided evidence of a link between the propensity for SI and SE and sexual problems in men. As predicted, high SIS-1 scores and low SES scores were found in samples of heterosexual men with erectile problems (Bancroft, Carnes, Janssen, Goodrich, & Long, 2005a; Bancroft et al., 2005b). In contrast, however, none of the SIS/SES scales were predictive of premature ejaculation (Bancroft et al., 2005b).

Although the SIS/SES was modified for use with women (Carpenter, Janssen, Graham, Vorst, & Wicherts, 2006), there was concern that the questionnaire did not tap some of the factors that might be most relevant to women's sexual response (e.g., none of the SIS/SES items covered relationship difficulties). Using a theoretical approach based on the dual control model, and qualitative data derived from focus groups of women (Graham, Sanders, Milhausen, & McBride, 2004), our research group developed a new questionnaire, the Sexual Excitation/Sexual Inhibition Inventory for Women (SESII-W) to assess a woman's tendency to respond with SE or SI to a variety of situations. In a sample of 655 women (M age, 33.9 years), factor analysis identified eight factors, and two higher-order factors, one related to excitation and one to inhibition (Graham, Sanders, & Milhausen, 2006). The three lower-level factors related to inhibition were: Relationship Importance (reflecting the need for sex to occur within a specific relationship context); Arousal Contingency (the potential for arousal to be easily inhibited or disrupted by situational factors); and Concerns about Sexual Function (the tendency for worries about sexual functioning to negatively influence arousal). The factors related to excitation were: Sexual Arousability (the tendency to become sexually aroused in a variety of situations); Partner Characteristics (the tendency for a partner's personality or behavior to enhance arousal); Sexual Power Dynamics (the tendency to become sexually aroused by force or domination in a trusting

sexual situation); Smell (the tendency for olfactory cues to enhance arousal); and Setting—Unusual or Unconcealed (the tendency for arousal to be increased by the possibility of being seen or heard while having sex or having sex in a novel situation).

The aim of the current study was to assess whether women's scores on the SESII-W, reflecting individual differences in propensity for SE and SI, correlated with their tendency to report sexual problems. We focused on the sub-sample of 540 self-identified heterosexual women from our initial validation study (Graham et al., 2006), as preliminary analyses had suggested that lesbian and bisexual women's scores on the SESII-W were significantly different from heterosexual women's scores. In addition to scores on the SESII-W, we examined the relative predictive value of the following sociodemographic and relationship variables that have been identified as predictors of sexual problems in previous studies (Laumann, Paik, & Rosen, 1999; West, Vinikoor, & Zolnoun, 2004): age, education, employment, relationship status, physical health, and importance of sex.

We believed that several of the factors from the SESII-W would have particular relevance as predictors of sexual problems. For example, previous studies have found that women who reported greater cognitive distraction during sexual interactions (related to performance concerns and body image concerns) also reported less sexual satisfaction, lower sexual esteem, and less consistent orgasms (Dove & Wiederman, 2000). Laboratory studies have also demonstrated a link between cognitive distraction and decreased sexual arousal, although most of this research has involved men (Adams, Haynes, & Brayer, 1985; Elliott & O'Donahue, 1997); Karafa & Cozzarella, 1997; Koukanas & McCabe, 1997). The Arousal Contingency factor of the SESII-W includes the following among its items: "When I am sexually aroused the slightest thing can turn me off," and "It is difficult for me to stay sexually aroused", both of

which may be related to possible distractions affecting sexual arousal. The Concerns about Sexual Function factor on the SESII-W consists of items that reflect performance concerns; for example, two of the four items on this scale are “If I am concerned about being a good lover, I am less likely to become aroused” and “Sometimes I feel so shy or self-conscious during sex that I cannot become fully aroused.” Therefore, based on previous research, we hypothesized that two of our inhibition factors—Arousal Contingency and Concerns about Sexual Function—would be particularly strong statistical predictors of women’s tendency to report sexual problems.

METHOD

Participants

Eligibility criteria included being 18 years or older and able to read English. Women were recruited using two methods. A random sample of student ($N = 300$) and staff/faculty ($N = 300$) addresses were selected from university telephone directories (“university sample”) and mailed a cover letter and questionnaire packet. Reminder telephone calls to the entire sample were made two weeks after the initial mailing of questionnaires. Of the 600 questionnaires mailed out, 226 were completed and returned (38% response rate). In a second “volunteer sample,” electronic recruiting (emails and listserv postings) and paper flyers were utilized. Targeted recruiting (e.g., cultural and community centers) was conducted in order to increase the diversity of the sample, particularly in terms of ethnicity and sexual orientation. Respondents in the volunteer sample ($N = 429$) were from 28 U.S. states and Canada. Recruitment flyers and cover letters/emails described the study purpose as “to collect information on women’s experience of sexual arousal” and “assess factors and types of situations that promote or interfere with women’s sexual interest or arousal.” Data from the two samples were combined for all analyses. Of the 655 women who completed the questionnaire, 540 (82.7%) self-identified as

“heterosexual”; these women were included in the analyses reported in the current study. Of these 540 participants, 210 (38.9%) were recruited from the university sample and 330 (61.1%) from the volunteer sample.

Table I contains the demographic/background characteristics of the sample. Mean age was 33.7 years (*SD* 13.9 years; range 18-81). Ninety-two percent (92.2%) of the participants were white, 5.2% Black or African American, and the remainder were other races. Only 2.8% were Hispanic. The largest religious subgroup classified themselves as Christian (26.9%), followed by Protestant (19.9%), Catholic (17.8%), other (16.8%) and none (18.6%).

As might be expected given that completion of the survey required that participants be literate and comfortable completing a lengthy questionnaire related to sexuality and that a subsample was recruited on a university campus, the sample was highly educated.

Measures

Demographic and Sexual History Questionnaire

The questionnaire began with a number of items assessing demographic and health variables: age, primary language, employment, education, religion and religiosity, race, ethnicity, income, marital and relationship status, and duration of current relationship (for those in a relationship), whether children were living in the home, physical health, and menstrual cycle status. Sexual history variables included four questions about sexual problems. There was one general question about current experience of sexual problems: “To what degree, if any, would you say you experience sexual problems?”, with six possible responses from “not at all” to “very strongly”. Three questions asked about lifetime experience of specific sexual problems: becoming or staying sexually aroused, difficulty in reaching orgasm/climax, and low sexual interest. For all three, women were asked “Have there been any times in your life when

[...specific problem...] was a problem for you?" The response categories were: never; less than half of the time; about half of the time; more than half of the time; and all of the time.

Sexual Excitation/Sexual Inhibition Inventory for Women (SESII-W)

The 36 items from the SESII-W refer to stimulus situations that could affect sexual inhibition and sexual excitation or to general statements about arousability and inhibition. As described in the Introduction and listed in Table II, the SESII-W has eight lower-order factors, which in turn load on two higher-order factors, Sexual Excitation and Sexual Inhibition (Graham et al., 2006). The questionnaire shows good test-retest reliability and convergent and discriminant validity and Sexual Excitation and Sexual Inhibition appear to be relatively independent factors. Cronbach's alphas for the current sample are reported in Table II.

The instructions asked women to report what would be the most typical reaction now or how they thought they would respond if the item did not apply to them. Items were rated on a 4-point Likert-rating scale, from "strongly disagree" to "strongly agree."

Procedure

The Institutional Review Board for the Protection of Human Subjects approved all procedures. Participants were mailed a questionnaire packet including a Study Information Sheet and an optically-scanable questionnaire. Those in the university sample also received a cover letter describing the random recruitment process used and eligibility criteria. They were told that the data would be used to develop a questionnaire related to women's sexual arousal and that they would be answering questions about their general background and their sexual history, attitudes, and responses. Questionnaires were completed anonymously. Returning a completed questionnaire constituted consent. Included in the questionnaire packet was a certificate for \$10 for completion of the questionnaire. Participants were informed that in order to receive payment,

they had to return the certificate and an envelope on which they wrote their name and address. These were mailed back to the researchers in a separate envelope from the completed questionnaire. No records were kept of this identifying information. This procedure protected anonymity while making payment available.

RESULTS

Participant Characteristics

Table II presents descriptive statistics for the eight lower-order factor scores of the SESII-W. Table III presents frequency distributions for sexuality-related characteristics of the sample.

 Insert Tables II and III about here

Correlations Among Sexual Problem Variables

There were moderate correlations among the variables related to sexual difficulties—arousal, interest, and orgasm. All were highly significant; most ranged from $\rho = .43$ to $.49$. The lowest correlation was between orgasm difficulty and low sexual interest ($\rho = .30$, $df = 536$, $p < .001$). The strongest correlation was found between problems with low sexual interest and difficulties becoming or staying aroused ($\rho = .58$, $df = 536$, $p < .001$).

Regression Analyses

Table IV presents the standardized beta coefficients for the significant statistical predictors of ratings for sexual problems, arousal difficulty, orgasm difficulty, and low sexual interest. The table also presents the adjusted R^2 for each model. The predictor variables used were the eight SESII-W lower-order factor scores and the demographic/background variables

listed in Table IV. For each sexual outcome variable, two models were compared, one including all participants and one including only those in a sexual relationship. This was done because being in a sexual relationship was found to be a statistically significant contributor to the models for sexual problems, arousal difficulty, and orgasm difficulty. Conducting a separate analysis for those who were in sexual relationships also permitted evaluation of the extent to which sexual-exclusivity and relationship duration in the current relationship contributed to the models.

Insert Table IV about here

Sexual Problems: Current

With regard to current sexual problems for the full sample, it can be seen that significant predictors were Arousal Contingency, Concerns about Sexual Function, and Partner Characteristics from the SESII-W and education level, physical health status, and current sexual relationship status, $F(6, 492) = 28.78, p < .001$. Bivariate analyses more clearly illustrate the findings from the multivariate analyses. Fig. 1 displays the significant positive relationships for Arousal Contingency, $F(5, 531) = 21.70, p < .001$ and Concerns about Sexual Function, $F(5, 532) = 14.27, p < .001$ across groups divided by ratings of sexual problems. Partner Characteristics was not included in the Figure as this did not retain a significant relationship to sexual problems ratings on a bivariate level, $F(5, 532) = 1.27, p = ns$.

Insert Figure 1 about here

Those women who had completed college had significantly higher ratings of sexual problems ($n = 281$, $M = 2.59$, $SD = 1.17$) than those who had not ($n = 253$, $M = 2.15$, $SD = 1.12$; $t = 4.44$, $df = 532$, $p < .001$). Women describing their physical health as “excellent” or “very good” had significantly lower ratings of sexual problems ($n = 397$, $M = 2.28$, $SD = 1.09$) than those who described it as “fair” or “good” ($n = 141$, $M = 2.67$, $SD = 1.31$; $t = -3.39$, $df = 536$, $p = .001$). Participants who were in a sexual relationship ($n = 411$, $M = 2.49$, $SD = 1.15$) had significantly higher ratings of sexual problems than those not in a relationship ($n = 127$, $M = 2.05$, $SD = 1.13$; $t = -3.79$, $df = 536$, $p < .001$).

When the model was restricted to those in a sexual relationship, sexual exclusivity entered into the model and physical health dropped out. Although not achieving bivariate significance, women in sexually-exclusive relationships had slightly higher levels of current sexual problems ($n = 367$, $M = 2.52$, $SD = 1.16$) than those in non-exclusive relationships ($n = 44$, $M = 2.23$, $SD = 1.10$, $t = 1.60$, $df = 409$, $p = ns$).

Arousal Difficulty: Lifetime

For lifetime arousal difficulty, the model for the full sample yielded the following significant predictors: Arousal Contingency and Concerns about Sexual Function from the SESII-W, and full-time employment and current sexual relationship status, $F(4, 494) = 49.27$, $p < .001$. Fig. 2 shows that higher scores on these inhibition-related SESII-W factors were associated with higher ratings of arousal difficulty (Arousal Contingency $F(4, 532) = 47.79$, $p < .001$ and Concerns about Sexual Function $F(4, 533) = 11.83$, $p < .001$).

 Insert Figure 2 about here

Those employed full-time had significantly higher ratings of arousal difficulty ($n = 261$, $M = 2.00$, $SD = 0.97$) than those not working full-time ($n = 275$, $M = 1.79$, $SD = 0.88$, $t = 2.64$, $df = 534$, $p = .009$). Women in a sexual relationship had significantly higher ratings of arousal difficulty ($n = 411$, $M = 1.98$, $SD = 0.94$) than those who were not in a relationship ($n = 127$, $M = 1.63$, $SD = 0.85$, $t = -3.73$, $df = 536$, $p < .001$). When the model was limited to those in a sexual relationship, full-time employment dropped out of the model.

Orgasm Difficulty: Lifetime

The model for lifetime orgasm difficulty included four SESII-W factors (Arousal Contingency, Concerns about Sexual Function, Relationship Importance, and Sexual Power Dynamics) as well as current sexual relationship status, and whether the woman had ever experienced orgasm, $F(6, 492) = 23.36$, $p < .001$. Fig. 3 depicts the bivariate relationships between Arousal Contingency, $F(4, 532) = 18.47$, $p < .001$, Concerns about Sexual Function, $F(4, 533) = 17.84$, $p < .001$, and ratings on orgasm difficulty. Post-hoc analyses did not demonstrate a bivariate association between orgasm difficulty and Relationship Importance, $F(4, 533) < 1$, $p = ns$, or Sexual Power Dynamics, $F(4, 533) = 1.39$, $p = ns$.

 Insert Figure 3 about here

As would be expected, those who had never experienced orgasm or said they were “unsure” had significantly higher ratings of orgasm difficulty ($n = 66$, $M = 3.81$, $SD = 1.77$) than those who reported that they had experienced orgasm ($n = 471$, $M = 2.39$, $SD = 1.07$, $t = -5.11$, $df = 535$, $p < .001$). Although bivariate statistical significance was not attained ($t = -1.19$, $df = 536$,

$p = ns$), in the multivariate model being in a relationship was associated with slightly higher ratings of orgasm difficulty.

Low Sexual Interest: Lifetime

Examining the model for lifetime problems with low sexual interest, significant predictors were: SESII-W Arousal Contingency, full-time employment, children living in the household, and marital status, $F(4, 494) = 53.64, p < .001$. Fig. 4 shows the positive bivariate relationship between Arousal Contingency and ratings of low sexual interest, $F(4, 532) = 46.28, p < .001$.

 Insert Figure 4 about here

Women employed full-time reported experiencing low sexual interest more often ($n = 261, M = 2.08, SD = 1.01$) than those not working full-time ($n = 275, M = 1.68, SD = 0.94, t = 4.55, df = 534, p < .001$). Women living with children gave significantly higher ratings of low sexual interest ($n = 147, M = 2.12, SD = 1.12$) than those without children in the household ($n = 390, M = 1.78, SD = 0.98, t = 3.36, df = 535, p = .001$). Ratings for married women were higher ($n = 202, M = 2.20, SD = 1.06$) than those for unmarried women ($n = 332, M = 1.67; SD = 0.95, t = 5.98, df = 532, p < .001$). The model for those in relationships differed in that marital status dropped out of the model and sexual exclusivity entered. Those in exclusive relationships reported significantly more problems with low sexual interest ($n = 366, M = 1.99, SD = 1.05$) than those in non-exclusive relationships ($n = 44, M = 1.57, SD = 0.93, t = 2.56, df = 408, p = .01$).

DISCUSSION

Our main objective was to investigate whether propensity for sexual excitation or sexual inhibition correlated with reporting of sexual problems in a non-clinical sample of women. We compared the statistically predictive power of factor scores on the SESII-W with that of selected demographic and relationship factors previously identified as correlates of sexual problems. Our outcome variables included one general question about current experience of sexual problems and three questions about lifetime experience of specific difficulties: becoming or staying sexually aroused, difficulty in reaching orgasm/climax, and low sexual interest.

We found moderate correlations among the variables related to sexual difficulties, with the strongest correlation between low sexual interest and arousal difficulties. This is consistent with previous studies that have reported high correlations between desire and arousal in women (Beck, Bozman, & Qualtrough, 1991; Rosen et al., 2000).

Demographic Predictors of Sexual Problems

Demographic factors did not feature largely in any of the models predicting sexual problems, even when statistically significant relationships were found. Although age showed significant positive bivariate correlations with reports of current sexual problems and with lifetime experience of both arousal difficulties and low sexual interest, it was not a significant predictor of sexual problems in any of the multivariate regression models, suggesting that other factors were more important. The literature on the relationship between age and sexual problems has been inconsistent. Most studies have reported an increase in most types of sexual problems with age (for review, see West et al., 2004), although Laumann et al. (1999) found that younger women were more likely to report sexual problems such as pain and sexual anxiety. In the recent UK Natsal Survey, there was no significant association between age and experience of relatively

short-term sexual problems but reports of persistent problems (lasting more than six months) increased with age (Mercer et al., 2005). Bancroft, Loftus, and Long (2003) reported that although low sexual interest increased with age, age was a poor predictor of “distress” about sex. As age is related to a number of other factors, such as marital status, parity, and menopausal status, it is important that researchers try to parse out the effects of age from such correlated factors.

Employment appeared as a significant predictor in the models predicting lifetime experience of arousal difficulties and low sexual interest. Women who currently worked full-time had higher reports of both of these specific problems. When the analysis was restricted to those in a current sexual relationship, however, employment dropped out of the model predicting arousal difficulties. The reasons for this are unclear. In a study by Rosen, Taylor, Leiblum, and Bachmann (1993), employment status was not predictive of sexual problems. Few other studies have examined employment as a potential correlate of reports of sexual problems. It is possible that the relationship between employment and these problems is mediated through tiredness or preoccupation related to employment.

Previous studies have examined whether the number of children a woman has is related to reports of sexual problems (Gruszecki, Forchuk, & Fisher, 2005; Kadri, Alami, & Tahiri, 2002); findings have been inconsistent. In the study by Mercer et al. (2005), women with young children in the home were more likely to report sexual problems. We found that having children living in the home was a significant predictor of lifetime experience of low sexual interest but not of arousal or orgasm difficulties or overall current sexual problems. Perhaps children in the home distract from sexual interest due to demands on the woman’s time or tiredness.

Educational background was a significant predictor in one of the models: women who had completed college had higher ratings of current sexual problems than those who had not. These findings are in accordance with those of a recent Canadian survey, which found that highly educated women were more likely to report both low sexual desire and infrequent coital orgasm (Gruszecki et al., 2005). In contrast, most previous studies have suggested that women with higher levels of education are less likely to report sexual problems (Kadri et al., 2002; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Laumann et al., 1999). Mercer et al. (2005) found no significant association between education and reporting sexual problems. Bancroft et al. (2003) observed a complex relationship between education and sexual problems, with college education increasing the likelihood of reporting “slight” distress about sex over either “no distress” or “marked distress.” Thus, the relationship between education and reports of sexual problems remains unclear. Perhaps the association may be mediated by differential expectations or differential reporting related to college education.

The only other demographic variables that featured in any of the models, physical health status and marital status, dropped out when the analysis was restricted to only women in a current sexual relationship and the variable “sexual exclusivity” entered the model. Being in a sexually exclusive relationship (vs. a non-exclusive, non-monogamous relationship) predicted both the experience of current sexual problems and lifetime experience of problems with low sexual interest. Previous research has again yielded inconsistent findings on the association between marital status and reports of sexual problems (Gruszecki et al., 2005; Kadri et al., 2002; Laumann et al., 1999). Mercer et al. (2005) found that while married and cohabiting women were significantly more likely to report sexual difficulties lasting at least one month, marital status was not associated with reporting persistent sexual problems (lasting six months or more).

It is possible that more detailed examination of the nature of sexual relationships in terms of sexual exclusivity and relationship duration may be necessary to clarify the association with sexual problems.

SESII-W Predictors of Sexual Problems

The strongest predictors of both current and lifetime sexual problems were the SESII-W inhibition factors Arousal Contingency and Concerns about Sexual Function. Arousal Contingency was a particularly strong predictor in the models for all four sexual problem variables. Although two of the items on this factor are likely to be related to distraction (“When I am sexually aroused, the slightest thing can turn me off” and “It is difficult for me to stay sexually aroused”), the third item is broader, reflecting the need for circumstances to be “just right” before arousal can be experienced (“Unless things are ‘just right,’ it is difficult for me to become sexually aroused”). The predictive utility of this factor is supported by the findings of Bradford (2006) of sexually-active premenopausal women (none of whom reported significant sexual concerns) who completed the SESII-W, the Female Sexual Function Index (FSFI; Rosen et al., 2000), and the State-Trait Anxiety Inventory (STAI; Spielberger, 1983). There were significant negative correlations between scores on the Arousal Contingency factor and scores on the Desire ($r = -.50$), Arousal ($r = -.60$), Lubrication ($r = -.34$), and Satisfaction ($r = -.36$) domains of the FSFI. Interestingly, there was also a moderately high correlation between Arousal Contingency and STAI trait anxiety ($r = .38$). This would be consistent with women scoring at the high end of the continuum for inhibition proneness having more cognitive interference.

Most studies on the effects of cognitive distraction on sexual arousal have been laboratory studies involving men. Summarizing this research, Cranston-Cuebas and Barlow (1990) suggested that differences in distractibility during sexual stimulation differentiate those

who do and do not experience sexual problems. Few studies have explored the association between cognitive distraction during sexual activity and sexual functioning in women, although an early study suggested that distraction may have more marked effects on women's sexual arousal than on men's (Przybyla & Bryne, 1984). Recently, in a study of college men and women, Meana and Nunnink (2006) assessed two types of self-reported cognitive distraction during sexual activity, performance- and appearance-based. Compared with men, women reported higher levels of appearance-based distraction, and similar levels of performance-based distraction. Dove and Wiederman (2000) found that women who reported greater cognitive distraction with a partner also reported less sexual satisfaction and less frequent orgasms. These investigators also focused solely on appearance- or sexual performance-based distraction. Obtaining qualitative and event-specific data (e.g., use of daily diaries) from women scoring high on Arousal Contingency could provide valuable insights into the specific content of cognitive distraction during sexual activity.

The other inhibition factor that predicted experience of both current sexual problems and lifetime arousal and orgasm difficulties (but not low sexual interest) was Concerns about Sexual Function (i.e., concerns about sexual performance reduced sexual arousal). This finding is consistent with previous work on men by Cranston-Cuebas and Barlow (1990). This association highlights the need to avoid causal inferences from correlational data. Clearly, the experience of sexual problems can cause concern/worry about sexual functioning and worry and concern about sexual functioning can cause sexual problems. One strength of the SESII-W is that the particular items on the Concerns about Sexual Function scale address concerns that are likely to be particularly salient for women, such as worrying about taking too long to become aroused or about whether an orgasm will occur (Graham et al., 2004). It may be worth noting that unlike

Arousal Contingency which had a strong Cronbach's alpha, Concerns about Sexual Function had the lowest alpha of any of the SESII-W factors suggesting it had weaker internal consistency.

Further research is needed to examine the reliability of this scale across diverse samples.

The remaining inhibition factor, Relationship Importance, was a predictor of only lifetime experience of orgasm difficulties in the context of the other variables in the regression model, but not in a bivariate fashion. Interestingly, *higher* scores on this factor (which reflects a woman's need for sex to occur within a specific relationship context to facilitate sexual arousal) predicted *less* experience of orgasm difficulties. This suggests that needing to trust a partner or feel emotionally safe to feel fully aroused may result in women being less vulnerable to experiencing orgasmic difficulties. Perhaps women scoring higher on Relationship Importance tended to restrict sexual activity to partners with whom they felt this trust and this facilitated orgasm. A recent review on women's orgasm concluded that partner variables have been under-researched (Meston, Levin, Sipski, Hull, & Heiman, 2004). Our findings suggest the potential importance of partner and relationship factors to orgasm problems in women.

In contrast with the inhibition factors, only two of the five excitation factors—Partner Characteristics and Sexual Power Dynamics—appeared in any of the regression models. Moreover, neither factor featured very strongly in the models and neither had a significant bivariate relationship with the sexual functioning variables. Higher scores on the Partner Characteristics factor (indicating a partner's personality or behaviors strongly affect the woman's sexual arousal) predicted current sexual problems. Higher scores on the Sexual Power Dynamics factor (reflecting the tendency for force or domination in a trusting sexual situation to enhance arousal) predicted greater orgasm difficulties. It is not clear why women scoring highly on either of these factors should be more vulnerable to sexual problems. It is conceivable that these

women may be more “dependent” on a partner’s behavior or require a particular set of stimuli to feel aroused; if these conditions for arousal are not met, they may be more likely to experience sexual problems.

Our results support predictions of the dual control model that high levels of SI in an individual will be associated with an increased vulnerability to experience sexual problems. We found little evidence that low SE predicted experience of sexual problems in women. In men, inhibition proneness (particularly SIS-1 “Inhibition due to the threat of performance failure”) has been consistently related to experience of lifetime and current erectile problems (Bancroft & Janssen, 2000; Bancroft et al., 2005b; Janssen et al., 2002). However, SES, a measure of sexual arousability, has also been related, albeit fairly weakly, to reports of erectile problems (Janssen et al., 2002; Bancroft et al., 2005b). It is also noteworthy that none of the SIS/SES scales have been predictive of premature ejaculation (Bancroft et al., 2005a; 2005b). The strong relationship observed between one of our inhibition factors, Arousal Contingency, and reports of all three problems assessed (low sexual interest, arousal difficulties, and orgasm difficulties) suggests that the concept of inhibition of sexual response has heuristic value in understanding sexual problems in women, possibly even more so than in men. It has previously been suggested that inhibitory mechanisms may of more fundamental importance in women (Bjorklund & Kipp, 1996).

Limitations

The purpose of this study was not to establish prevalence rates for sexual problems but to explore relationships between sexual problems and SE and SI factors. Given this objective, the fact that a reasonable proportion of women reported at least low levels of sexual problems was an advantage. However, a limitation was our use of a convenience sample and as such, the findings with regard to prevalence of sexual problems cannot be generalized.

Another limitation of the present study was that we asked a fairly limited number of questions about experience of sexual problems. We did, however, assess specific sexual problems as well as overall sexual problems. In contrast, a number of previous studies have looked at correlates of “sexual dysfunction” in general rather than specific sexual problems (West et al., 2004). This may obscure differential relationships between specific sexual problems and predictor variables.

Although SI and SE are theorized as traits, whether scores on the SESII-W reflect a “state” or “trait” has not been established. Are we assessing individual differences relevant to vulnerability to sexual problems (“trait”) or the outcome of an existing sexual problem (“state”)? This issue also applies to the male SIS/SES measure (Bancroft et al., 2005). Longitudinal prospective studies are needed to resolve this issue.

Conclusion

In summary, factors related to sexual inhibition as measured by the SESII-W appear to be relevant to sexual functioning in women. The inhibition factors of Arousal Contingency and Concerns about Sexual Function were good predictors of ratings of sexual problems. This is the first study that has used the dual control model to formulate hypotheses about the factors associated with experience of sexual problems in women. Although many previous studies have identified sociodemographic factors associated with reporting sexual problems (for review, see West et al., 2004), few studies have explored possible personality factors or self-reported reactivity to sexual stimuli and situations to investigate why some individuals experience sexual problems and others do not. Future research is needed to confirm these findings with other samples, particularly clinical samples of women seeking help for sexual problems. If future research supports the predictive utility of the SESII-W in identifying women who are more likely

to experience sexual difficulties, these factors may be used as prognostic factors in treatment studies (Bancroft et al., 2005).

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REFERENCES

- Adams, A. E., Haynes, S. N., & Brayer, M. A. (1985). Cognitive distraction in female sexual arousal. *Psychophysiology*, *22*, 689-696.
- Bancroft, J. (1999). Central inhibition of sexual response in the male: A theoretical perspective. *Neuroscience and Biobehavioral Reviews*, *23*, 763-784.
- Bancroft, J., Carnes, J., Janssen, E., Goodrich, D., & Long, J. S. (2005a). Erectile and ejaculatory problems in gay and heterosexual men. *Archives of Sexual Behavior*, *34*, 285-297.
- Bancroft, J., Herbenick, D., Barnes, T., Hallam-Jones, R., Wylie, K., Janssen, E., et al. (2005b). The relevance of the dual control model to male sexual dysfunction: The Kinsey Institute/BASRT Collaborative Project. *Sexual and Relationship Therapy*, *20*, 13-30.
- Bancroft, J., & Janssen, E. (2000). The dual control model of male sexual response: A theoretical approach to centrally mediated erectile dysfunction. *Neuroscience and Biobehavioral Reviews*, *24*, 571-579.
- Bancroft J., Loftus J., & Long J. S. (2003). Distress about sex: A national survey of women in heterosexual relationships. *Archives of Sexual Behavior*, *32*, 193-208.
- Barlow, D. H. (1986). The causes of sexual dysfunction: The role of anxiety and cognitive interference. *Journal of Consulting and Clinical Psychology*, *54*, 140-148.
- Beck, J. G., Bozman, A. W., & Qualtrough, T. (1991). The experience of sexual desire: Psychological correlates in a college sample. *Journal of Sex Research*, *28*, 443-456.
- Bjorklund, D. F., & Kipp, K. (1996). Parental investment theory and gender differences in the evolution of inhibition mechanisms. *Psychological Bulletin*, *120*, 163-188.
- Bradford, A. (2006). [Correlations between SESII-W scores and Female Sexual Function Index and trait anxiety]. Unpublished raw data.

- Carpenter, D. L., Janssen, E., Graham, C. A., Vorst, H., & Wicherts, J. (2006). *Estimating the factor structure, reliability, and validity of women's scores on the Sexual Inhibition/Sexual Excitation Scales (SIS/SES)*. Manuscript submitted for publication.
- Cranston-Cuebas, M. A., & Barlow, D. H. (1990). Cognitive and affective contributions to sexual functioning. *Annual Review of Sex Research, 1*, 119-162.
- Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex and Marital Therapy, 26*, 67-78.
- Elliott, A., & O'Donohue, W. T. (1997). The effects of anxiety and distraction on arousal in a nonclinical sample of heterosexual women. *Archives of Sexual Behavior, 26*, 607-624.
- Graham, C. A., Sanders, S. A., & Milhausen, R. (2006). The Sexual Excitation and Sexual Inhibition Inventory for Women: Psychometric properties. *Archives of Sexual Behavior, 35*, 397-410.
- Graham, C. A., Sanders, S. A., Milhausen, R., & McBride, K. (2004). Turning on and turning off: A focus group study of the factors that affect women's sexual arousal. *Archives of Sexual Behavior, 33*, 527-538.
- Gruszecki, L., Forchuk, C., & Fisher, W. A. (2005). Factors associated with common sexual concerns in women: New findings from the Canadian Contraception Study. *The Canadian Journal of Human Sexuality, 14*, 1-13.
- Janssen, E., Vorst, H., Finn, P., & Bancroft, J. (2002). The Sexual Inhibition (SIS) and Sexual Excitation (SES) Scales: I. Measuring sexual inhibition and excitation proneness in men. *Journal of Sex Research, 39*, 114-126.
- Kadri, N., Alami, K. M. H., & Tahiri, S. M. (2002). Sexual dysfunction in women: Population based epidemiology study. *Archives of Women's Mental Health, 5*, 59-63.

- Karafa, J. A., & Cozzarella, C. (1997). Shyness and reduced sexual arousal in males: The transference of cognitive interference. *Basic and Applied Social Psychology, 19*, 329-344.
- Kinsey, A. C., Pomeroy, W. B., Martin, C. E., & Gebhard, P. H. (1953). *Sexual behavior in the human female*. Philadelphia: W. B. Saunders.
- Koukanas, E., & McCabe, M. (1997). Sexual and emotional variables influencing sexual responses to erotica. *Behaviour Research and Therapy, 35*, 221-230.
- Laumann, E. O., Paik, A., & Rosen, R. C. (1999). Sexual dysfunctions in the United States: Prevalence and predictors. *Journal of the American Medical Association, 281*, 537-544.
- Meana, M. & Nunnink, S. E. (2006). Gender differences in the content of cognitive distraction during sex. *Journal of Sex Research, 43*, 59-67.
- Mercer, C. H., Fenton, K. A., Johnson, A. M., Wellings, K., Macdowall, W., McManus, S., et al. (2003). Sexual function problems and help seeking behaviour in Britain: National probability sample survey. *British Medical Journal, 327*, 426-427.
- Mercer, C. H., Fenton, K. A., Johnson, A. M., Copas, A. J., Macdowall, W., Erens, B., et al. (2005). Who reports sexual function problems? Evidence from the 2000 National Survey of Sexual Attitudes and Lifestyles ('Natsal 2000'). *Sexually Transmitted Infections, 81*, 394-399.
- Meston, C. M., Levin, R. J., Sipski, M. L., Hull, E. M., & Heiman, J. R. (2004). Women's orgasm. *Annual Review of Sex Research, 15*, 173-257.
- Przybla, D. P. J., & Byrne, D. (1984). The mediating role of cognitive processes in self-reported sexual arousal. *Journal of Research in Personality, 18*, 54-63.
- Rosen, R., Brown, C., Heiman, J., Leiblum, S., Meston, C., Shabsigh, D., et al. (2000). The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. *Journal of Sex and Marital Therapy, 26*, 191-208.

Rosen, R. C., Taylor, J. F., & Leiblum, S. R. (1993). Prevalence of sexual dysfunction in women: Results of a survey study of 329 women in an outpatient gynecological clinic. *Journal of Sex and Marital Therapy, 19*, 171-188.

West, S. L., Vinikoor, L. C., & Zolhoun, D. (2004). A systematic review of the literature on female sexual dysfunction prevalence and predictors. *Annual Review of Sex Research, 15*, 40-172.

Table I.

Demographic and Background Characteristics (N= 540).

Variable	
<u>Age</u>	
% 18-19	22.6
% 20-29	24.1
% 30-39	19.5
% 40-49	15.4
% 50-59	14.8
% 60-81	3.7
<u>Employment</u>	
% Full-time	48.5
% Part-time	23.8
% Not employed	27.7
<u>Education</u>	
% less than college	15.7
% some college or college degree	60.6
% post-graduate degree	23.7
<u>Children in household</u>	
% Yes	27.3

Table I continued

<u>Demographic/Background Variable</u>	
<u>Marital status</u>	
% single/never married	43.8
% living with partner, but not married	4.5
% married	37.6
% widowed	0.9
% separated/divorced	12.9
<u>Current sexual relationship status</u>	
% exclusive/monogamous	68.1
% non-exclusive/non-monogamous	8.1
% not in a sexual relationship	23.7
<u>Relationship duration (years) (n = 406)</u>	
M (SD)	8.1 (9.2)
Range	0.8-50
<u>Health</u>	
% excellent	27.6
% very good	46.1
% good	23.7
% fair	2.4
% poor	0

Demographic/Background Variable

Importance of Sex

% very important	25.5
% important	46.2
% slightly important	23.6
% not important at all	4.7

Table II.

Descriptive Data for the SESII-W Lower-order Factors (N = 540) Ratings were as follows:

1=strongly disagree; 2=disagree; 3=agree; and 4=strongly disagree.

Factor	M	SD	No. of Items	Cronbach's Alpha
<u>Sexual Excitation</u>				
Arousability	2.97	.44	9	.80
Sexual Power Dynamics	2.52	.62	4	.65
Partner Characteristics	3.11	.47	4	.66
Setting (Unusual/Unconcealed)	2.43	.58	4	.70
Smell	3.11	.63	2	.79
<u>Sexual Inhibition</u>				
Arousal Contingency	2.14	.58	3	.78
Concerns about Sexual Function	2.59	.51	4	.61
Relationship Importance	3.08	.51	6	.73

Table III.

Summary of Data on Sexual Problem Variables (N= 540).

Variable	Percentage
<u>Sexual Problems – Current</u>	
Not at all	23.4
Very little	37.7
A little	23.0
Moderately	10.4
Strongly	3.5
Very strongly	1.9
<u>Arousal Difficulty – Lifetime</u>	
Never	37.5
Less than half of the time	45.2
About half of the time	8.9
More than half of the time	6.9
All of the time	1.5
<u>Orgasm - Ever</u>	
Yes	87.5
No	7.1
Unsure	5.4

Table III continued.

Variable	Percentage
<u>Orgasm Difficulty – Lifetime</u>	
Never	21.4
Less than half of the time	39.4
About half of the time	15.8
More than half of the time	15.8
All of the time	7.6
<u>Low Sexual Interest – Lifetime</u>	
Never	45.0
Less than half of the time	34.9
About half of the time	10.2
More than half of the time	7.4
All of the time	2.4

Table IV.

Standardized Beta Coefficients For Each Statistically Significant Predictor For Multiple Regression Analyses.

Predictor Variables	Sexual Problems		Arousal Difficulty		Orgasm Difficulty		Low Interest	
	All	In Rel. ^a	All	In Rel.	All	In Rel.	All	in Rel.
<u>Sexual Inhibition</u>								
Arousal Contingency	.28***	.34***	.45***	.49***	.23***	.27***	.48***	.54***
Concerns about Sexual Function	.22***	.23***	.10*	.10*	.26***	.22***		
Relationship Importance					-.12**	-.11*		
<u>Sexual Excitation</u>								
Arousability								
Setting (Unusual/Unconcealed)								
Sexual Power Dynamics					.12**	.14**		
Partner Characteristics	.10**	.10*						
Smell								

Table IV continued.

Predictor Variables	Sexual Problems		Arousal Difficulty		Orgasm Difficulty		Low Interest	
	All	In Rel.	All	in Rel.	All	in Rel.	All	in Rel.
<u>Demographic/Background</u>								
age (years)								
full-time employment (Yes/No)			-.10**				-.13**	-.13**
completed college (Yes/No)	-.15***							
children in household (Yes/No)							-.12**	-.15***
married (Yes/No)							-.10**	
health - low rating is "excellent"	.12**							
importance of sex - low rating is "very important"								
in a sexual relationship (No/Yes)	.17***		.16***		.12**			
exclusive sex rel (Yes/No)		-.09*						-.10**
relationship duration (years)								
orgasm ever					.16***	.23***		

Table IV continued.

Predictor Variables	Sexual Problems		Arousal Difficulty		Orgasm Difficulty		Low Interest	
	All	in Rel.	All	in Rel.	All	in Rel.	All	in Rel.
<u>Adjusted R²</u>	.25	.25	.28	.28	.21	.26	.30	.34

Note:

^aResults are shown for the analysis including all participants (“All”) and the analysis including only those in relationships (in Rel.)

* $p < .05$

** $p < .01$

*** $p < .001$

Figure Captions

Figure 1. Mean scores on Contingent Arousal and Concerns About Sexual Function for women grouped by ratings of sexual problems. Higher ratings indicate greater levels of sexual problems: 1= not at all (n = 126); 2 = very little (n = 203); 3 = a little (n = 124); and 4-6 = moderately to very strongly (n = 85).

Figure 2. Mean scores on Contingent Arousal and Concerns About Sexual Function for women grouped by ratings of arousal difficulty. Higher ratings indicate more frequent experience of arousal difficulty: 1 = never (n = 202); 2 = less than half of the time (n = 243), and 3-5 = about half of the time through always (n = 93).

Figure 3. Mean scores on Contingent Arousal and Concerns About Sexual Function for women grouped by ratings of orgasm difficulty. Higher ratings indicate more frequent experience of orgasm difficulty: 1 = never (n = 115); 2 = less than half of the time (n = 212), 3 = about half of the time (n = 85); 4 = more than half of the time (n = 85); 5 = always (n = 41).

Figure 4. Mean Contingent Arousal Scores for women grouped by ratings of problems with low sexual interest. Higher ratings indicate more frequent experience of low sexual interest: 1=never (n=242); 2=less than half of the time (n=188), 3= about half of the time (n=55); 4=more than half of the time (n=40); 5=always (n=13).

Figure 1.

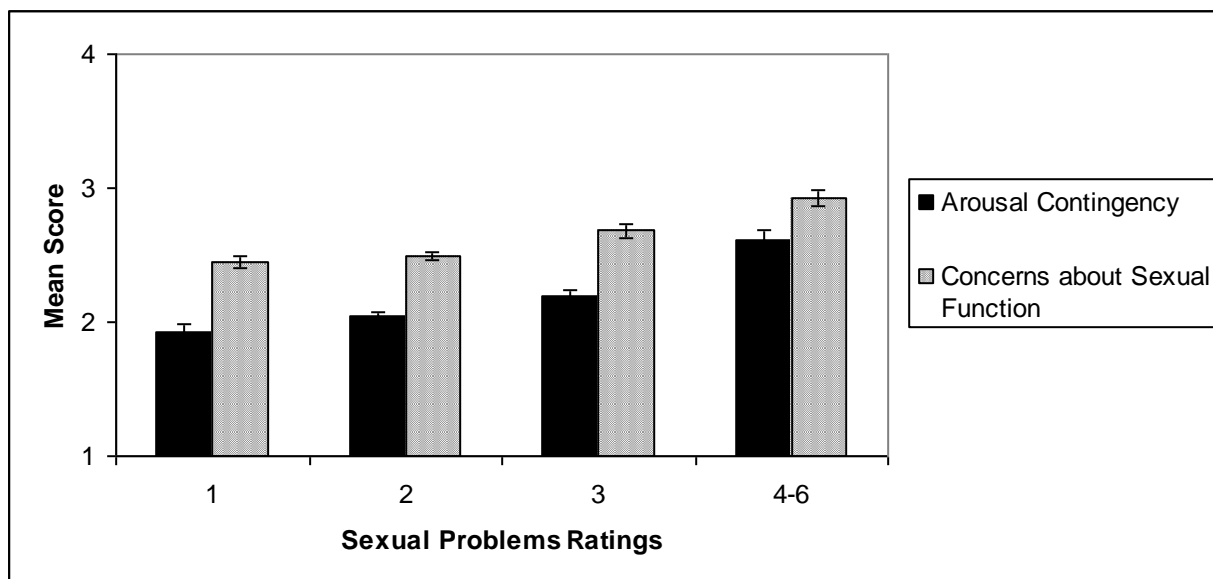


Figure 2.

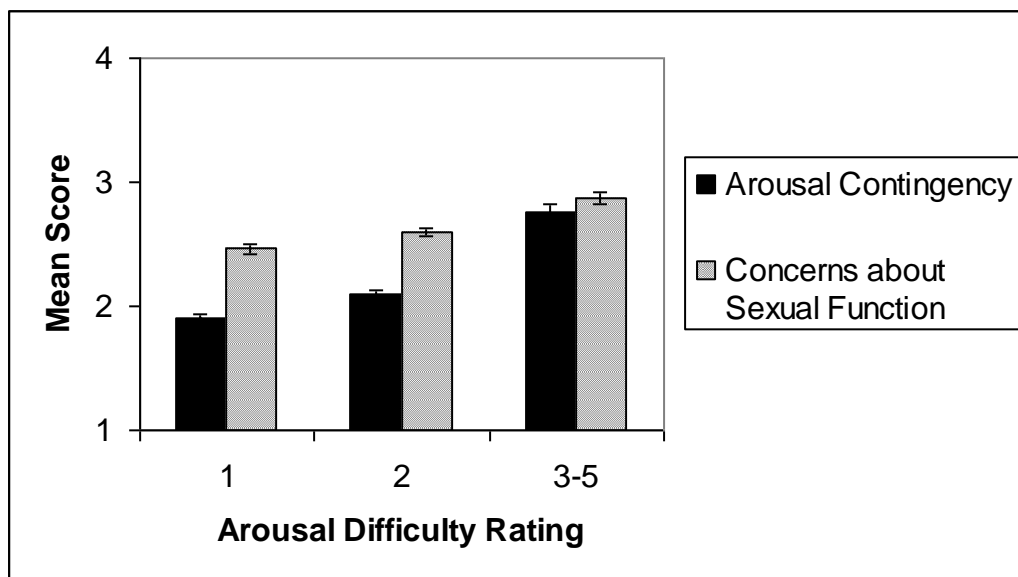


Figure 3.

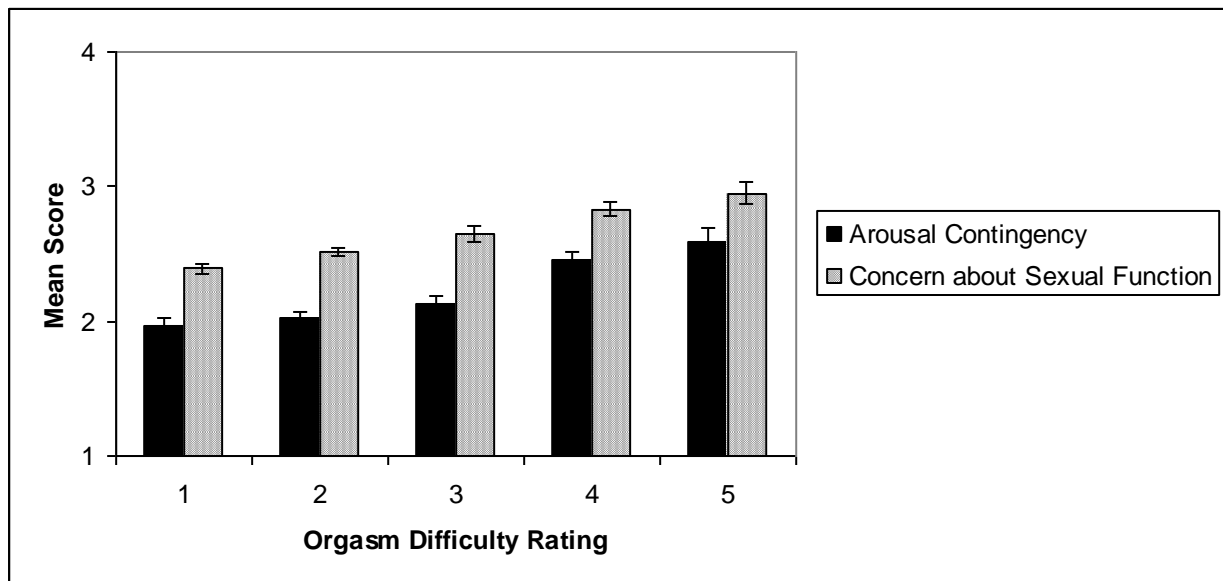


Figure 4.

